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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,307	06/23/2003	Masumi Kubo	4034-36	7959

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EXAMINER	
VU, PHU	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,307	KUBO ET AL.	
	Examiner	Art Unit	
	Phu Vu	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9,10,14-19* is/are rejected.

7)☒ Claim(s) *17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment A (dated 12/29/04), Terminal Disclaimer (filed 12/29/04), IDS (filed 12/29/04)

2. Claims 1-19 are presented for examination.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in the prior office action.

Response to Arguments

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Claim 1-5, 14-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et. al US Patent No. 6,342,938 and in further view of Kim US Patent 6342876. Regarding claim 1, Song teaches A liquid crystal display device, comprising: a first substrate (fig 7 element 20) a second substrate (fig 7 element 10); and a liquid crystal layer (fig 7 element 30) provided between the first substrate and the second substrate, wherein: a plurality of picture element regions (fig. 6) are defined each by a first electrode (fig. 7 element 21) provided on one side of the first substrate that is closer to the liquid crystal layer and a second electrode (fig. 7 element 11) provided on the second substrate so as to oppose the first electrode via the liquid crystal layer (fig. 7 element 30) therebetween, the first electrode includes, in each of the

plurality of picture element regions, a plurality of unit solid portions arranged in a first direction (fig. 7 element 11), whereby the liquid crystal layer takes a vertical alignment in the absence of an applied voltage (fig. 1A) between the first electrode and the second electrode, and forms a plurality of liquid crystal domains in the plurality of unit solid portions of the first electrode by inclined electric fields produced around the plurality of unit solid portions in response to a voltage applied between the first electrode and the second electrode, each of the plurality of liquid crystal domains taking a radially-inclined orientation (see figure 6 element 110) and the plurality of picture element regions are arranged in a matrix pattern including a plurality of rows extending in the second direction different from the first direction and a plurality of columns extending in the first direction (see fig. 14 and 15). A unit solid portion is considered a portion of the pixel electrode where no gap is present. The only limitation the reference does not teach is a polarity of a voltage applied across the liquid crystal layer in a first picture element region among the plurality of picture element regions is different from a polarity of a voltage applied across the liquid crystal layer in a second picture element region among the plurality of picture element regions that belongs to the same row as that of the first picture element region and belongs to a column adjacent to a column to which the first picture element region belongs in each frame. Kim US Patent 6342876, discloses a polarity of a voltage applied across the liquid crystal layer in a first picture element region among the plurality of picture element regions is different from a polarity of a voltage applied across the liquid crystal layer in a second picture element region among the plurality of picture element regions that belongs to the same row as that of the first

picture element region and belongs to a column adjacent to a column to which the first picture element region belongs (see figure 9C and 9D). **Regarding claim 3,** the reference also teaches the polarity of voltage applied across the LC layer in a plurality of picture element regions belonging to one column is reversed from every N rows where N is 1 or greater (see fig. 9C and 9D). **Regarding claim 4**, Kim also teaches the polarity of voltage applied across the LC layer in the first picture element region is different from the LC polarity of a voltage applied across the LC layer in a third picture element that belongs in a same column as that of the first picture element region and belongs to a row adjacent to a row to which the first picture element region belongs in each from (see fig. 9C and 9D). All of these features are added to reduce flicker. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use opposite driving voltages in a second picture element region different from a column adjacent to the column while in the same row as a first and a third picture region different from the first that bellows to a the same column in a row adjacent to a row to which the first element belongs, where the polarity of voltage applied across the LC layer in a plurality of picture element regions belonging to one column is reversed from every N rows where N is 1 or greater in order to reduce flicker.

Regarding claim 2, the primary reference teaches a picture element region having a longitudinal direction is defined in a first direction, and a width defined in the second direction (see fig. 6).

Regarding claim 5, the primary reference discloses unit solid portions have rotational symmetry (see fig. 6).

Regarding claim 14, the primary reference teaches a first substrate that includes a plurality of open regions (see fig. 4 element 216) that do not overlap with the first electrode, and when a voltage is applied forms a plurality of additional LC domains in the plurality of open regions by the inclined electric fields, each of the additional LC taking a radially inclined direction (see fig. 4 element 110).

Regarding claim 15, the reference teaches open regions wherein at least some of the plurality of open regions (see fig. 3 element 216 and 217) have substantially the same shape and size, and form a plurality of unit lattices that are also arranged to have rotational symmetry.

Regarding claim 16, the primary reference teaches the open regions having rotational symmetry.

Regarding claim 19, the primary reference teaches a plurality of switch elements (TFTs see column 5 lines 45-50) for a plurality of picture element regions, and the first electrode comprises a plurality of picture element electrodes provided respectively for the plurality of picture element regions and the first electrode comprises a plurality of picture element electrodes (fig. 4 element 21) provided respectively for the plurality of picture element regions and the second electrode (fig. 4 element 11) is at least one counter electrode opposing the plurality of picture element electrodes. The limitation of switching of the TFTs is inherent, because any transistor will be able to switch between on and off states.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song and Kim as applied to claim 1 and in view of Horie et. al US Patent No

5673092. Song and Kim teach all the limitations of claim 9 except an orientation-regulating structure on the second substrate that exerts an orientation-regulating force for orienting LC molecules into a radially-inclined orientation in the presence of applied voltage. Kim discloses an orientation-regulating structure on the second substrate that exerts an orientation-regulating force for orienting LC molecules into a radially-inclined orientation in the presence of applied voltage (see fig 10 A element 4 and column 10 lines 12-18) and **regarding claim 10** this is formed at the center of at least one of the LC domains. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to include a domain-centered orienting structure to create a radial orientation of the LC molecules.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song, Kim, and Horie as applied to claim 9 and in view of Takeda et. al EPO application 0884262.

As per claim 11, Song, Kim and Horie teaches all the limitations of claim 11 except the orientation regulating-structure exerting an orientation-regulating force for orienting even in the absence of an applied voltage.

As per claim 12, Song, Kim and Horie, teach all the limitations of claim 12 except the orientation-regulating structure is a protrusion protruding from the second substrate into the LC layer.

As per claim 13, Song, Kim and Horie do not teach the thickness of the liquid crystal layer is defined by the first protrusion protruding from the second substrate into the liquid crystal layer.

Regarding claim 11, Takeda teaches an orientation regulating-structure exerting an orientation regulating force for orienting in the absence of applied voltage (see figure 17 element 20 and also see page 4 lines 40-44).

Regarding claim 12, Takeda teaches the orientation regulating structure is a protrusion protruding form the second substrate into the liquid crystal layer (see figure 17 element 20).

Regarding claim 13, Takeda teaches the thickness of the liquid crystal layer is defined by the first protrusion protruding from the second substrate that regulates the thickness of the liquid crystal layer.

All of these features of claims 11-13 are formed to achieve a perfect black display and achieve higher contrast (see page 4 lines 46-47). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to add a protrusion that regulates orientation of LC in the absence of applied voltage and regulates the thickness of the liquid crystal layer to improve contrast of the liquid crystal display.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song, Kim, and Horie as applied to claim 5 above and in view of Chuang et. al US Pub No. 2002/0085152.

Song, Kim and Horie do not teach unit solid portions of a circular wherein each of the plurality of unit solid portions has a generally circular shape. Chuang US Publication No. US 2002/0085152 teaches a unit solid portion of circular shape (see figure 2C and also) element 12. Unit sold portions are considered solid portions of the pixel electrode.

These portions are circular to enhance pretilt for the liquid crystal molecules. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use unit solid portions of a circular shape to enhance pretilt of the LC molecules.

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song, Kim, and Horie as applied to claim 5 above and in view of Yamada et. al US Patent No. 5473450. Song, Kim and Horie teach all the limitations of claim 7 except unit solid portions of a generally rectangular shape with arc-shaped corners. Yamada teaches a unit solid portion with a generally rectangular shape and arc-shaped corners (see figure 17 elements d and e) to provide excellent contrast (column 12 line 67). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to make unit solid portions of rectangular shape with rounded corners to provided excellent contrast.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song, Kim, and Horie as applied to claim 5 above and in view of Ohkubo US Patent No. 4878742. Ohkubo teaches all the limitations claim 8, except unit solid portions of acute angle shape. Ohkubo teaches unit solid portions of an acute angle shape (see figure 2A element 25) to form a highly reliable and productive display with a high degree of time division characteristics (see column 2 lines 25-30). Unit solid portions are considered solid portions of the pixel electrode (ie non gapped). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use acute angled corners to provide a highly reliable and productive display with a high degree of time division and a highly reliable and productive display.

Terminal Disclaimer

The terminal disclaimer filed on 12/29/2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Ahiro US Patent No. 6,710,825 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

Claims 17-18 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 17, there is no prior art of record that teaches open regions of circular shape, Song teaches open regions that would be consider star-like shaped.

Regarding claim 18, there is no prior art of record that teaches a second protrusion within each of the plurality of open regions of the first substrate wherein a side surface of the protrusion exerts, for LC molecules of the LC layer, an orientation regulating force of the same direction as a direction of orientation regulation of the inclined electric field.

Conclusion

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 12/27/2004 item 6,342,938 not filed in the original IDS prompted the new ground(s) of rejection presented in this Office

action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Vu whose telephone number is (571)-272-1562. The examiner can normally be reached on 8AM-5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800